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A Southern Utah entrepreneur has completed a series of experiments at Southern Utah University confirming that an unusual phase of deuterium can exist under the right conditions. This research is based on the work of Prof. Leif Holmlid at the University of Gothenburg in Sweden.

Mike Taggett, who founded Chums, a sports accessories company, in 1983, is a long time inventor and researcher. Since selling Chums in 2002, Mike has spent most of his time working on alternative energy projects and inventions. He has worked in two labs prior to the one in Cedar City in attempts to verify the existence of Ultra Dense Deuterium (UDD). Deuterium is an isotope of hydrogen, exists in sea water and contains a neutron along with the proton in its nucleus making it heavier than hydrogen.

He has been studying dense deuterium for the past 5 years and has visited over 15 universities looking for a physics professor that would collaborate with him. "Most physics departments are pretty busy and they are reluctant to spend any time on a material they are skeptical about". He says. "I understand they are busy but Holmlid has spent over 12 years and has published over 30 papers; it's a significant discovery." In 2016, Mike was able to rent lab space at the University of Idaho and looked for changes in surface conductivity of metal samples being exposed to the catalyzed gas. "I was able to build up a good system; vacuum chamber, fast impedance analyzer, etc. but it turned out to be very tricky to get stable readings so the results were not reliable." I was trying to work there a year later in a laser lab but the project got stuck in bureaucracy." So Mike kept looking for places to work and did odd jobs to pay the bills.

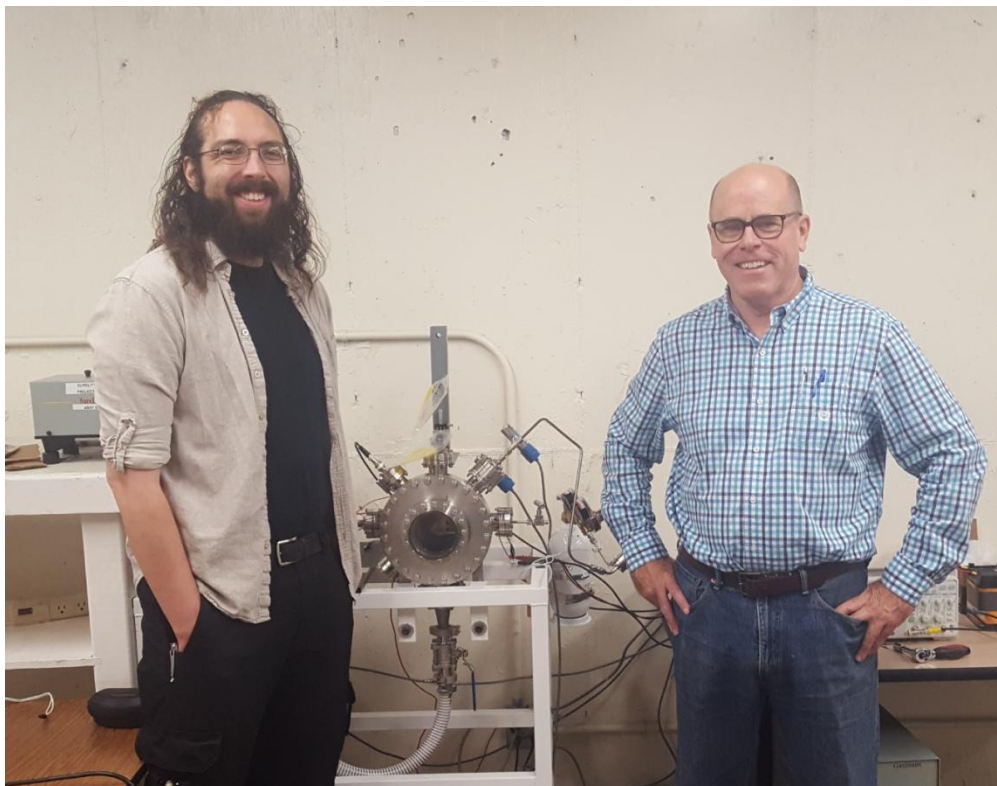
He had sold his home and was basically a science vagabond staying in cheap motels around the west. "I was staying in Cedar City and wandered over to SUU. I knew it was a 4 year teaching university, rather than having much research, but I thought I would take a look. I met Professor Ali Siahpush while waiting to see the Engineering Dept. Chair and I mentioned research and he said "Research? Great! If it aligns with our mission and you can use a student to help that would be great!" "Everyone was really helpful getting me going." Mike says. Mike was on a shoestring budget and built up a system with a rebuilt vacuum chamber, parts from eBay and a laser he borrowed from another university on condition he could repair it.

Mike and his assistant Ben Thrift, an engineering student, had things up and running in 5 weeks. The work and data collection focused on comparing how the laser "ablates" the metal before and after deposition of the ultra dense layer (ablation is a term for removing material) and in this case the material evaporates directly from the solid rather than melting first.

Mike says, "Looking into the vacuum chamber through the window, it looks like a welding torch when running as the pulsing laser is powerful but for very short times, about 5 nano seconds per pulse!" Mike and Ben ran over 20 multi-day experiments on a variety of metals and saw a definite change after the dense layer formed. "It would take 200 -300% longer to ablate through the metal. Pretty amazing considering the invisible UDD layer is really thin, perhaps just atoms thick!" "Of course there is always the chance of an alternative explanation but right now the results are positive," he says.

Mike thinks the dense deuterium could have applications for energy storage or space propulsion. "It's really fun and challenging to work in an emerging field. I am one of just three groups that I know of working on this." "Who knows what can be done with this unique material?"

The next step he says is to further the work with different types of particle and energy detectors to better understand UDD. Mike says, "A big thanks to Julia Anderson, Dean Robert Eves and professors Ali Siahpush, Matt Roberts, Scott Munro and Sangho Bok for helping me get going at SUU." www.ternresearch.com



SUU Engineering student Ben Thrift (L) and Mike Taggett

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